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The Ultimate Sum Formula in Excel

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Many times in Excel, I want to sum all the cells above a certain point. For example, in cells A1 to A3 I have three numbers, so I click on cell A4 and type Alt+=, which automatically inserts =SUM(A1:A3). The problem occurs when I want to add a new row. If I insert a row before row 4, the formula does not change to include the new row until I enter a number in that cell. As a workaround, I sometimes leave a blank row above the row containing the SUM formula and include that blank row in the formula. For example, I will leave row 4 blank and type =SUM(A1:A4) in row 5. Now when I insert a new row above the blank row, the formula immediately changes to include it.

What I really want is a formula to sum all values above the cell containing the formula. After many attempts, I came up with this:

```
=SUM(INDIRECT(ADDRESS(1,COLUMN(),4) & ":" & ADDRESS(ROW()-1,COLUMN(),4))).
```

No matter where this formula is placed, it always calculates the sum of all cells above it. There is only one small disadvantage: If you edit a cell containing a simple formula like =SUM(A1:A3), Excel will highlight the range being summed. With this more complex formula, Excel can't do that.

Johan Parlevliet

You can do an awful lot of spreadsheet design without running into the INDIRECT and ADDRESS functions. ADDRESS takes a row number and column number and returns the corresponding cell reference as text. Its third argument determines whether the row and column references are absolute or relative. In the formula above, the value of 4 for the third argument selects relative references for both rows and columns. ADDRESS(1,COLUMN(),4) in column 1 returns A1. ADDRESS(ROW()-1,COLUMN(),4) returns a text string representing the cell immediately above the cell containing the formula. The INDIRECT formula goes the other way: It takes a cell or range reference expressed as text and converts that reference into an actual reference that can be used by another function. Finally, the SUM function sums the reference returned by INDIRECT.

We suggested a somewhat different function, using INDIRECT but not ADDRESS: =SUM(INDIRECT("R1C"&COLUMN()&":R"&(ROW()-1)&"C"&COLUMN(),FALSE)). This function builds a reference in the R1C1 style (for example, R1C3:R9C3) and passes it to INDIRECT. The FALSE argument tells INDIRECT that the reference is not in A1 style but in R1C1 style. The reader pointed out that this solution is language-specific. It did not work in his Dutch version of Excel, because there the reference is of the form R1K1. The solution using ADDRESS is language-independent.

We should note that Excel 2003 has a new *Lists* feature that is designed specifically to address the above problem. To use it, put the cursor anywhere in your list, even the *Totals* row, and press Ctrl-L (or go to *Data | Lists | Create List*). The feature gives you an extra row to add more values to the list, updates the SUM formula dynamically, and removes the extra row when you click outside the list.

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